IN THE CLAIMS

Claims 1 to 50 (cancelled)

Claim 51 (currently amended) A composition comprising :

(i) a polymeric system comprising at least one polymer in water-based solvent which is capable of undergoing a transition that results in an at least two-fold increase in its viscosity, said at least one polymer being ~~characterized by at least one of the following features:~~

~~having a viscosity at body temperature which is higher than 22,000 Pas following said transition;~~

~~comprising a block copolymer having more than three blocks;~~

~~and~~

capable of undergoing a condensation reaction in the presence of water resulting in an increase in the molecular weight of the polymeric system;

(ii) bone marrow cells (BMC); and

(iii) at least one of demineralized bone matrix (DBM) and, demineralized tooth matrix (DTM) .

Claim 52. (currently amended) A composition according to claim 51, wherein said composition further comprises bone morphogenetic protein ~~growth factor~~ (BMP).

Claims 53 and 54 (cancelled)

Claim 55 (Previously Presented) A composition according to claim 51, wherein said at least one polymer is capable of undergoing said transition in response to a triggering effect at a body site.

Claim 56. (Previously Presented) A composition according to claim 55 wherein said at least one polymer is capable of undergoing said transition in response to said triggering effect which includes a change in at least one of temperature and pH.

Claim 57. (Previously Presented) A composition according to claim 52, wherein said at least one polymer is capable of undergoing said transition in response to a triggering effect at a body site.

Claim 58. (Previously Presented) A composition according to claim 57, wherein said at least one polymer is capable of undergoing said transition in response to said triggering effect which includes a change in at least one of temperature and pH.

Claims 59 to 62 (cancelled)

Claim 63. (cancelled)

Claims 64 to 66 (cancelled)

Claim 67. (Cancelled)

Claim 68. (Withdrawn) A method for regenerating musculoskeletal tissue, said method comprising:

providing a composition comprising at least one polymer in a water-based solvent which is capable of undergoing a transition that results in an at least two fold increase in its viscosity, bone marrow cells (BMC) and one of demineralized bone matrix (DBM) or demineralized tooth matrix (DTM) ; and

thereafter applying the composition to existing musculoskeletal tissue.

Claim 69 (cancelled)

Claim 70. (Withdrawn) A method according to claim 68, wherein said transition takes place in response to a triggering effect at a body site.

Claim 71. (Withdrawn) A method according to claim 70, wherein said transition takes place in response to said triggering effect which includes a change in at least one of temperature and pH .

Claims 72 to 80 (cancelled)

Claim 81. (Previously Presented) A composition according to claim 58, further comprising at least one additional biomolecule to be delivered into the body selected from the group consisting of elastin, collagenous material, albumin, a fibrinous material, growth factors, enzymes, an immunosuppressant, an immunomodulator, an antibiotic, an anti-inflammatory agent and a hormone.

Claim 82. (Currently Amended) A composition according to claim 58, wherein said at least one polymer is a reverse thermo-gelating (RTG) polymer~~, said polymer being a random [-PEG6000-O-CO-$(CH_2)_4$-CO-O-PPG3000-]$_n$ poly(ether-ester) or an alternating [-PEG6000-O-CO-O-PPG3000-]$_n$ poly(ether-carbonate)~~.

Claim 83. (Previously Presented) A composition according to claim 58, wherein the number of bone marrow cells in the composition is from about 10^6 to $4x10^{10}$ cells/ml.

Claim 84. (Currently amended) The composition according to claim 58, wherein the DBM is of vertebrate origin.~~, preferably of human origin.~~

Claim 85. (Previously Presented) The composition according to claim 58, wherein the DBM is in powder, particles, string or sliced form.

Claim 86. (Currently Amended) The composition according to claim 85, wherein said ~~DMB~~ DBM is in powder or particle form~~, wherein the particle size of the DBM is about 50 to 2500μ, preferably about 250 to 500μ~~.

Claim 87. (Currently Amended) The composition according to claim 58, wherein the ratio between BMC and DBM is between 1:1 and 20:1 (volume:volume)~~., preferably between 2:1 and 9:1 (volume:volume), particularly 4:1 (volume:volume).~~

Claim 88. (Currently amended) A composition comprising bone marrow cells (BMC), and demineralized bone matrix (DBM) or demineralized tooth matrix (DTM), together with a responsive polymeric system comprising site-responsive reverse thermo-gelating (RTG) biodegradable polymer~~. optionally further comprising pharmaceutically acceptable carrier, additive, diluent and/or excipient, wherein said RTG polymer is biodegradable.~~

Claim 89. (Currently amended) The composition according to claim 88, wherein said site-responsive polymer is a polymeric system or RTG polymer comprising at least one silicon-containing reactive group~~, said at least one group being a mono-, di- or tri-functional group~~.

Claim 90. (Previously Presented) The composition according to claim 88, wherein said responsive polymeric system generates a polymer selected from the group consisting of a linear

polymer, a graft polymer, a comb polymer, a star-like polymer, a crosslinked polymer and combinations thereof.

Claim 91. (Previously Presented) The composition according to claim 88, wherein said responsive polymeric system also comprises additional reactive groups selected from the group consisting of hydroxyl, carboxyl, thiol, amine, isocyanate, thioisocyanate and double bond-containing active groups and combinations thereof.

Claim 92. (Currently amended) The composition according to claim 88, wherein said responsive polymeric system also comprises a solid component, ~~preferably a biodegradable material~~.

Claim 93. (Previously Presented) A composition according to claim 88, wherein the number of bone marrow cells in the composition is from about 10^6 to $4x10^{10}$ cells/ml.

Claim 94. (Currently amended) The composition according to claim 88, wherein the DBM is of vertebrate origin~~, preferably of human origin~~.

Claim 95. (Previously Presented) The composition according to claim 88, wherein the DBM is in powder, particles, string or sliced form.

Claim 96. (Currently Amended) The composition according to claim 95, wherein said ~~DMB~~ DBM is in powder or particle form, wherein the particle size of the DBM is about 50 to 2500μ~~, preferably about 250 to 500μ~~.

Claim 97. (Currently amended) The composition according to claim 88, wherein the ratio between BMC and DBM is between 1:1 and 20:1 (volume:volume)~~, preferably between 2:1 and 9:1 (volume:volume), particularly 4:1 (volume:volume)~~.

Claim 98. (Currently amended) The composition according to claim 88, wherein said composition contains BMC-DBM mixture and RTG polymer at a ratio between 5:1 to 1:5, ~~preferably between 3:1 and 1:2, particularly at a ratio of 2 parts BMC-DBM mixture to 1 part of RTG polymer material in fluid form~~ (volume:volume).

Claim 99. (withdrawn) A method for transplantation of a composition comprising BMC with DBM, together with a site-responsive polymer, and optionally further comprising pharmaceutically acceptable carrier or diluent and/or additional active agent/s, into any one of a joint, a cranio-facial-maxillary bone, an alveolar bone of maxilla and mandibula, spine, pelvis and a long bone, or for construction or reconstruction of an extraskeletal bone, including for mechanical or biological support of artificial implants to a joint or of a joint or to a bone of a subject in need, wherein said method comprises introducing into said joint or bone a composition as defined in claim 88.

Claim 100. (Withdrawn) The method according to claim 99, wherein said composition is administered non-invasively by a syringe, an arthroscopic procedure or by open surgery into the site of implantation.

Claim 101. (Withdrawn) A method of treating a damaged joint, post traumatic, inflammatory, autoimmune, infectious or degenerative etiology associated with malformation and/or dysfunction of cartilage and/or subchondral bone in a mammal, preferably a human in need of such treatment, comprising administering into an affected joint or bone of said mammal a composition according to claim 88.

Claim 102. (Withdrawn) The method according to claim 101, wherein the bone marrow cells comprised in said composition are either allogeneic or said mammal's own.

Claim 103. (Withdrawn) A non-invasive implantation method for support of implants of joints or other musculoskeletal implants, comprising introducing a graft into a joint or a cranio-facial-maxillary bone of a subject in need, wherein said graft comprises a composition according to claim 88.

Claim 104. (Withdrawn) A kit for performing transplantation of BMC in admixture with DBM and a site-responsive polymer into any one of a joint, a cranio-facial-maxillary bone, an alveolar bone of maxilla and mandibula, spine, pelvis and long bones, or for construction or reconstruction of an extraskeletal bone, including for mechanical or biological support of

artificial implants to the joint or of the joint or to the bone of a mammal, wherein said kit comprises:

(a) DBM in powder, particle, string or slice form;

(b) a site-responsive polymer;

(c) a bone marrow aspiration needle;

(d) an intra-osseous bone drilling burr;

(e) a needle with a thick lumen for infusion of viscous bone marrow-DBM-site-responsive polymer mixture;

(f) a 2-way lumen connector for simultaneous mixing of BMC with DBM and site-responsive polymer and diluent;

(g) a medium for maintaining BMC;

(h) optionally additional factors stimulating osteogenesis; and

(i) cryogenic means for handling and maintaining BMC or BMC together with DBM.

Claim 105. (Withdrawn) The kit according to claim 104, optionally further comprising a carrier and/or diluent for the BMC and DBM mixture, and for the site-responsive polymer.

Claim 106. (New) A composition according to claim 89, wherein said at least one silicon-containing reactive group is a mono-, di- or tri-functional group.

Claim 107 (New) The composition according to claim 58, wherein the DBM is of human origin.

Claim 108. (New) The composition according to claim 88, wherein the DBM is of human origin.

Claim 109 (New) The composition according to claim 58, wherein the ratio between BMC and DBM is between 2:1 and 9:1.

Claim 110 (New) The composition according to claim 58, wherein the ratio between BMC and DBM is 4:1 (volume:volume).

Claim 111 (New) The composition according to claim 88, wherein the ratio between BMC and DBM is between 2:1 and 9:1.

Claim 112 (New) The composition according to claim 88, wherein the ratio between BMC and DBM is 4:1 (volume:volume).

Claim 113. (New) A composition according to claim 88, further comprising pharmaceutically acceptable carrier, additive, diluent and/or excipient.

Claim 114 (New) A composition according to claim 86, wherein the particle size of the DBM is 250 to 500μ.

Claim 115 (New) A composition according to claim 96, wherein the particle size of the DBM is 250 to 500μ.

Claim 116 (New). The composition according to claim 88, wherein said responsive polymeric system also comprises a solid biodegradable material.

Claim 117 (New). The composition of claim 51, wherein said at least one polymer is capable of undergoing said condensation reaction under physiological conditions.

Claim 118. (New) The composition of claim 51, wherein said at least one polymer has at least one silicon-containing reactive group.

Claim 119 (New) The composition of claim 118, wherein said at least one silicon-containing reactive group react at 37°C to increase the molecular weight of the polymeric system.

Claim 120 (New) The composition of claim 89, wherein said silicon-containing reactive group reacts at 37°C to increase the molecular weight of the polymeric system.

Claim 121 (New) The composition according to claim 88, wherein said composition contains BMC-DBM mixture and RTG polymer at a ratio between 3:1 and 1:2 (volume:volume).

Claim 122 (New). The composition according to claim 88, wherein said composition contains BMC-DBM mixture and RTG polymer at a ratio of 2 parts BMC-DBM mixture to 1 part of RTG polymer material in fluid form (volume:volume).

Claim 123 (New) A composition comprising:

(i) a polymeric system comprising at least one polymer in water-based solvent, said polymer being capable of undergoing a condensation reaction in the presence of water, said condensation reaction resulting in an increase in the molecular weight of the polymeric system;

(ii) bone marrow cells (BMC); and

(iii) at least one of demineralized bone matrix (DBM) and, demineralized tooth matrix (DTM) .

Claim 124 (New) A composition comprising:

(i) a polymeric system comprising at least one polymer in water-based solvent, said polymer being capable of undergoing a condensation reaction in the presence of water, said condensation reaction resulting in an increase in the molecular weight of the polymeric system and in at least twofold increase in the viscosity of said polymeric system;

(ii) bone marrow cells (BMC); and

(iii) at least one of demineralized bone matrix (DBM) and, demineralized tooth matrix (DTM).